Improved Operator Awareness of Criticality Safety at PFP

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Manager Solutions Stabilization Project

History

- 1996
  - One processing line started up after years of shutdown inactivity
  - 5 serious criticality infractions in a few months
  - Facility shutdown to work on criticality safety implementation improvements
- 2000
  - Four major process lines running:
    - $Mg(OH)_2$ precipitation
    - Residues repackaging
    - Five thermal stabilization furnaces
    - Bagless Transfer System

Change the Culture

- Finding criticality safety problems is a good thing
  - Rewarded staff for finding problems
  - Looked even harder when a problem was found
  - Really dug into the details of criticality posting requirements
  - Expected to see a rise in problems and did not over react when the spike was seen
  - Now routinely look at criticality safety issues in our monthly plant performance meeting to determine trends

Reporting Changes

- Removed the punitive nature from event reporting.
  - Moved from who screwed up to what happened, why , and how we can fix
- Implemented a graded infraction program.
  - Used ideas from Rocky Flats and ORNL.
  - Put in a scoring system to help CSR determine reportability

Graded Infraction Program

Criticality Safety Nonconformance and Reporting Definition Matrix

Number of Contingencies Remaining	Type of Nonconformance	Definition of Type of Nonconformance	Reporting Category	Reporting Criteria
Two or more	Nonconformance	A condition related to criticality safety that is: Outside the boundaries of a rule, requirement or standard practice other than a CPS requirement Or Involves a CPS but no fissile (<15 grams) material is involved.	Internal	Failure of a control, but at least two or more contingencies remain intact.
	Infraction	A CPS requirement was breached, but double contingency has been maintained and there is no realistic way to cause criticality.		
One	Violation	A significant loss of control which either breached or had a high potential of breaching double contingency.	Off Normal	Any nuclear safety nonconformance that results in a loss of contingency, such that only one valid criticality control remains in place.
None	Potential Criticality	Loss of control to the extent that no known reliable mechanisms to prevent criticality are functional. The safety factors are not identifiable or are unknown.	Unusual Occurrence	Violation of the double contingency specifications such that no valid controls are available to prevent a criticality accident.
	Near Criticality	Loss of control to the extent that only random factors prevent a criticality.		

The Operator is the Customer

- Staffed plant with CSRs who believe the operator is the customer
  - Always go to the field when a question arises
  - Encourage a questioning attitude and willingly process changes that make field implementation simple
  - Develop simple one or two page postings
  - Now have 3 qualified CSRs and 2 CSEs in the plant
- Involve the operator in project planning
  - Mockups/Processing Monopoly
  - Project construction
  - Procedure development
  - Senior operator lessons learned (No one wants to be shutdown again!)

The Operator is the Customer (cont)

- Involve the Operator in all phases of criticality safety development
  - Initial involvement in the hazard operation reviews
  - Review and approval of CSER, CPS, and Postings
  - Facility walk downs in the field during project scooping meetings.
- Include criticality safety as a priority in daily job planning
  - Pre job briefings
  - Glovebox walk downs
  - Actual material handling evolutions

Common Approach for Material Movement

- Five major groups, four different fissile handling procedures pre-1996
- One common procedure for moving fissile material through entire plant
  - Training the same
  - Group to group handoffs the same
  - Review of causal factors from events easier and more quickly understood by staff.

Practical Training

- Traditional training focused on criticality safety rules
- Implemented more practical training
  - Not what is a 10 inch spacing limit ?
  - Rather How do you maintain 10 inch spacing ?
  - Strong involvement by CSR in continuing training, use of practical examples and real PFP situations.